

## Isolation and Resistance Threshold Determination of Selenate-resistant Bacteria from Three Industrial Wastewater and Sewage Sludge of Khuzestan Province

Fatemeh Yaghoobizadeh\*; Mohammad Roayaei ardekani

*Shahid Chamran University of Ahvaz, Ahvaz, Iran*

f\_yaghoobizadeh@yahoo.com

**Background & Objectives:** Selenium is a dietary essential trace element but it is toxic at micromolar concentrations. It has toxic effects at micromolar concentrations and its excessive uptake can cause different disorders in humans. Human activities such as industrial wastewaters and agricultural effluents have resulted in severe disturbance of selenium ecological balance. Microorganisms could be potentially used for the bioremediation of polluted sites because they have different mechanisms for detoxification of selenium such as oxidation/reduction. Therefore, the aim of this research is isolation and study on potential of bacteria that can growth at high concentrations of sodium selenate.

**Methods:** To isolate the resistant bacteria Serial dilutions of wastewater and sludge samples, cultured on mLBA medium supplemented with 0.2 mM sodium selenate and incubated at 30°C for 72 hr. More resistance isolates were selected upon their growth capability in medium containing 1-160 mM of the metal. Resistance threshold was study by determination of MIC at the range 32.5-1200 mM in mLB broth, MBC and disc diffusion methods.

**Results:** Among the 72 isolates from the first level, 9 isolates were obtained in second level. Among them only one isolate has highest MIC (equal to 1200 mM) and minimum inhibition zone and selected for next studies.

**Conclusion:** Because physico-chemical wastewater treatment methods are insufficient, finding the microorganisms with bio-removal potential of metals, are converted to suitable alternates to them. With the regard to high resistance threshold of the obtained isolate in comparison to other studies, with doing more tests can use it for environmental cleaning.

**Keywords:** Selenium; Microorganism; Detoxification; Resistance Threshold